

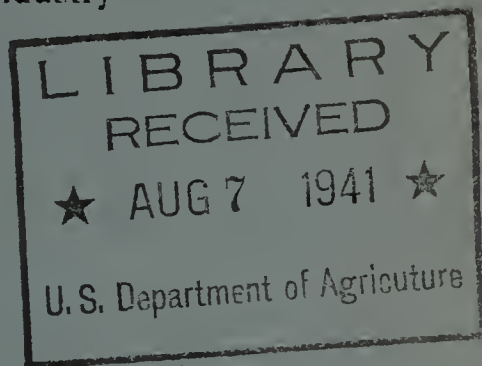
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U. S. Department of Agriculture  
U. S. Bureau of Animal Industry



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THE BUREAU OF ANIMAL INDUSTRY  
AND ITS WORK

By John R. Mohler, Chief,  
Washington, D. C.

APR 1941

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The Bureau has for distribu-  
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## U. S. BUREAU OF ANIMAL INDUSTRY

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The Bureau of Animal Industry came into existence on May 29, 1884, with the approval of the Act of Congress entitled: "AN ACT For the establishment of a Bureau of Animal Industry, to prevent the exportation of diseased cattle, and to provide means for the suppression and extirpation of pleuro-pneumonia and other contagious diseases among domestic animals." As this title implies it is charged with the building up and protecting of the livestock industry of the United States. These protective measures include the control and eradication of animal diseases, such as tuberculosis, cattle-tick fever, hog cholera, brucellosis (Bang's disease), glanders, anthrax, influenza, sheep and cattle scabies, and other diseases. Coupled with these activities are extensive experimentation on farms, research work in laboratories and the application of control measures in the field. A further measure is the inspection of imported animals and supervision of those exported. There are conducted experiments in the breeding and development of improved types of horses, cattle, sheep, goats, swine, and poultry. Inspection is maintained at all large slaughtering establishments for abnormal conditions of the animals slaughtered and supervision is exercised over the processing and preparation of meat food products. Close inspection is made at public stockyards of incoming shipments for the detection of infectious and contagious diseases.

In accordance with the practice throughout the Department, this Bureau is organized on a basis of divisions according to work, as described elsewhere. For facility and economy of operation, administrative functions common to the entire Bureau are grouped in a Division of Business

Administration. The various units aid the Chief in the determination of general policies and the supervision of all activities. Specific duties include the preparation of estimates of expenditures for the Bureau of the Budget and for Congress; the choosing, appointing and assigning of employees; the handling of matters of discipline, leave, promotions, etc.; the issuing of expenditure authorizations, including travel, the audit of salary, reimbursement, purchase and indemnity claims; the purchase of supplies and equipment; the keeping of records of property, of expenditures for administrative purposes and for congressional reports; of appropriation encumbrances for liabilities; the dissemination of public information through the press, radio, exhibits, and other channels; the scrutiny of manuscripts and other preparations for printing; the drawing of regulations in accord with the laws; the receipt, classification and distribution of mail, with subsequent dispatch of letters and the filing of correspondence; and the conduct of a considerable library.

### Animal Disease Station

At the Animal Disease Station, located at Beltsville, Md., since 1936 as a unit of the Beltsville Research Center, studies are made of the various diseases affecting domestic animals. Among the major diseases currently investigated are brucellosis of cattle (Bang's disease), swine, and goats, tuberculosis, mastitis, hog cholera, swine erysipelas, infectious anemia of horses, equine encephalomyelitis, periodic ophthalmia, anaplasmosis, exanthematous diseases simulating foot-and-mouth disease, fowl leukosis, avian encephalomyelitis, and infectious laryngotracheitis. Practically every animal disease, except those due to nutritional deficiencies, has been studied at one time or another at this Station. Studies are also made of various factors relating to artificial insemination in animals.



Special laboratories have been constructed for the preparation of a standard Brucella antigen used in Federal-State Bang's disease control work, of Brucella vaccine used in the calfhood vaccination program, and for the testing of all Brucella vaccine produced commercially.

The Station makes periodic tests of tuberculin made and sold under Government license. Tests are made of material suspected of being infected with foot-and-mouth disease or other communicable diseases of livestock, for purpose of control work. Tests are also made of various remedies and biological products sold and alleged to be cures or preventives for infectious diseases of animals. Special biological products, blood serum, etc., are supplied by the Station to the various Bureau laboratories.

It maintains a guinea-pig-raising establishment which supplies these experimental animals for investigational purposes. The various green forage crops, required for animal feeding, are raised on the premises.

In addition to the needs of its own corps of research workers, the Animal Disease Station furnishes facilities to other divisions of the Bureau in Washington in investigations requiring the use of large experimental animals.

### Animal Husbandry Division

The work of this Division consists chiefly of research in the breeding and management of domestic farm animals and poultry, and studies of their products.

Beef and dual-purpose cattle investigations include a study of the application of fundamental principles of genetics in the development of superior strains and crossbred types; the study of new methods for determining superiority,

including record of performance tests; management studies in the utilization of pastures and ranges; research with dual-purpose cattle to develop strains capable of averaging high milk production and efficiency in the production of beef.

Swine investigation work includes research to develop superior strains with greater inherent capacity for rapid growth and economy of gain, high fertility, and quality of carcass; studies with physiology of reproduction of swine and in improved brood-sow management and feeder production.

Sheep investigations include research on the improvement of inherent capacity for efficient production of high-quality lamb, mutton, wool, and fur under the environmental conditions of the various regions of the country; application of genetic principles to the development of strains, breeds, and types of sheep most efficient for production; the study of improved methods of management of sheep on pastures and ranges and under various degrees of shelter; and study of the physical, chemical, and biological structures of wool and other animal fibers. Goat studies include breeding experiments with milk goats to determine methods of improving production.

Horse studies include the production and use of light horses; endurance and stamina of the Morgan breed; the development of a lighter type of draft horse suitable for general field-power needs under present-day conditions; and the study of the physiology of reproduction with mares and stallions.

Poultry studies include breeding for increased egg production, fertility and hatchability of eggs, and low chick mortality; the development of new types of chickens and turkeys better adapted to present-day conditions; the effects of breeding on viability; studies on the physiology of reproduction of poultry, and the administration of the National Poultry Improvement Plan in cooperation with participating States to improve the production and breeding qualities of chickens and reduce losses of chicks from pullorum disease.



In cooperation with State experiment stations and other agencies, the Division is conducting investigations or correlating the nation-wide study of the factors which influence the quality and palatability of meat and conducting experiments to determine the effects of chilling, ripening, curing, smoking, storing, and rendering of meats, including yields and shrinkages in slaughter, cutting and processing, and the effect of the breeding and feeding of the animals on the quality and palatability of the meat produced.

Principles of animal breeding are being tested and formulated with the inbreeding and cross breeding of guinea pig and mice families of known ancestry and with the inbreeding and cross breeding of the various classes of farm livestock and poultry with the object of improving our domestic breeds of animals.

Under the Tariff Law providing for the free entry of imported purebred livestock for breeding purposes by citizens of the United States, the Division investigates the reliability and accuracy of books of record and the identity of such animals, and issues certificates of pure breeding for cattle, sheep, goats, horses, swine, dogs, and cats imported for this purpose.

### Animal Nutrition Division

The activities of this Division are directed chiefly to research and to the dissemination of information on livestock nutrition and feeding including the chemistry of feeds and animal products. Work is conducted at the Beltsville Research Center, at various field stations and cooperatively with State experiment stations with beef and dual-purpose cattle, horses, sheep, goats, swine, and poultry. Attention is given also to advisory and cooperative work on other species including pet stock and fur-bearing animals and to companion studies on small laboratory animals.

The investigations are concerned with problems of the fundamental nutritional requirements of animals whether for reproduction, lactation, growth, or fattening and including the production of meat, wool, and eggs and of measuring the nutritive properties of feedstuffs in order to develop the best methods of using feeds to obtain maximum results.

The investigations with swine are directed at the development of methods that will keep pigs in a healthy, growing condition from birth to market age and will contribute to the production of the desired qualities in the dressed carcasses and the meat and meat products.

Sheep feeding is studied in various regions of the country to determine the nutritive requirements of sheep and the influence of various feeds and forages on the growth of sheep and the production of mutton, lamb, wool, and fur. Work with goats deals largely with the production and value of goat's milk.

Horse and mule investigations are concerned with the nutritional relationships to various kinds of unsoundness which decrease the work output and general usefulness and to the development of improved feeding practices in the production of these animals.

Work is conducted on both beef and dual-purpose cattle to develop improved methods of feeding including consideration of specific nutritive factors that limit reproduction, lactation, growth and fattening and methods of cattle production and of the resulting meat products.

Likewise work with poultry is designed to assist farmers in producing quality poultry and poultry products more efficiently by acquiring more information on nutritive requirements of poultry and the formulation of improved diets based on information gained on the nutritive properties of the feedstuffs that are or may be used as feedstuffs. Attention is given to problems of egg production and hatchability, of growing stock and of quality factors in the eggs and meat.

In the usual case, the work of the Animal Nutrition Division is integrated with that of the Animal Husbandry Division in the basic problem of livestock production.

### Field Inspection Division

Activities of this Division include eradication of scabies of cattle and sheep and dourine of horses in co-operation with the livestock sanitary authorities of the various States; the investigation of reported outbreaks of disease among livestock to determine if they are communicable and, if so, assist local authorities in their control and eradication.

Other work of the Division is the administration of regulations governing the inspection and testing of livestock intended for export to determine their freedom from disease, and the inspection of fittings and accommodations on vessels on which they are to be transported. The inspection of all livestock offered for importation to determine freedom from disease is mandatory under the law. Inspectors are assigned along the international boundaries and on the seacoasts to inspect these animals, examine accompanying certificates and, when necessary, place the livestock in quarantine and maintain them under observation during specified periods. Animals in quarantine are subjected to certain diagnostic tests and those found to be affected with or to have been exposed to any communicable disease are refused entry and are returned to the country of origin or destroyed.

The duties of this Division also include control over import animal byproducts, hay and straw, to prevent the introduction or dissemination of communicable livestock diseases, and the administration, jointly with the Treasury Department, of section 306 (a) of the Tariff Act of 1930, prohibiting the importation of domestic ruminants or swine, or chilled, or frozen fresh meats deprived therefrom, from countries where foot-and-mouth disease or rinderpest exists.



## Interstate Inspection Division

This Division administers the regulations of the Department governing the interstate movement of livestock, the object being to prevent the spread of communicable diseases from one State to another.

The inspection of livestock for interstate movement being an essential service in the control of disease, an inspection force is maintained at officially designated stockyards. The object is to prevent the dissemination of livestock diseases by detecting, segregating, and supervising the proper treatment or other disposal of animals affected with or exposed to contagious, infectious, or communicable disease, and supervising the cleaning and disinfection of all cars, trucks, and other conveyances used in transporting infected animals and all pens, chutes, and alleys in which such animals are handled.

When diseased animals are found upon inspection at public stockyards, their origin is immediately reported to the livestock sanitary officials of the State where the shipment originated. In this way centers of infection are located and the disease is prevented from reaching other farms and ranches.

It is also the duty of this Division to investigate alleged violations of the 28-hour law. The object of this law is to prevent cruelty to animals in the course of interstate transportation by prohibiting railroads from transporting them in interstate commerce for a longer period than 28 consecutive hours without unloading in a humane manner into properly equipped pens for feed, water, and rest for at least 5 consecutive hours. The time of confinement may be extended to 36 hours upon written request of the shipper.

## Meat Inspection Division

This Division is responsible for the administration of the Federal meat inspection regulations. The service consists of seven essential parts; namely; (1) sanitation; (2) ante-mortem inspection; (3) post-mortem inspection; (4) product inspection; (5) laboratory inspection; (6) control and destruction of condemned materials, and (7) marking and labeling. The inspection applies to cattle, sheep, swine, goats, and to their meats, also to horses and horse meat. Description of these procedures follows:

Meat inspection is not inaugurated at an establishment until it and its premises have been made to conform to the requirements as to sanitation and facilities for the conduct of inspection. Thereafter the maintenance of sanitation in accordance with advanced principles of meat hygiene is required. Examples of essential requirements in sanitation include: Potable and ample water supplies; sanitary drainage system; abundance of natural and artificial light; sufficient ventilation, and adequate hot water supply for clean-up purposes.

The purpose of ante-mortem inspection is to search out, mark, and segregate from the lot of animals for condemnation or, when conditions warrant, for separate slaughtering and post-mortem inspection, any and all that show indications of disease or unfit condition. Those found unfit for food purposes are condemned and destroyed, while those less affected, after segregation, are marked by affixing to the ear a serially numbered metal tag bearing the imprinted phrase "U. S. Suspect" and are held under control for separate slaughter. Animals found apparently fit are passed for slaughter.



Post-mortem inspection begins and proceeds simultaneously with slaughtering and carcass-dressing operations. Those carcasses in which disease or other abnormal or questionable conditions are detected and those segregated for slaughter on ante-mortem inspection are given an individual identity by means of special, numbered "U. S. Retained" tags. All such tagged product is kept under the control of the inspector until final disposition is made of it after a searching examination by skilled veterinarians. It is a requisite that the evisceration of each animal be conducted in the close presence of the inspector. Each set of viscera is examined while the identity of the carcass is maintained. The organs and principal lymph glands are palpated and some are incised. The lungs, liver, lymph glands principally, and the spleen, especially of swine, also the heart and other muscle tissue not infrequently disclose evidence of a serious nature. More than 70,000,000 animals are examined annually at a cost for ante-mortem, post-mortem, and product inspection of approximately 7 cents per animal or, based on the weight of the dressed meat, about 1/26 cent per pound.

As complete ante-mortem and post-mortem veterinary inspections are essential and form the basis of scientific meat inspection, so is it important under well-ordered meat hygiene that meat previously inspected and passed at the time of slaughter be further inspected and reinspected after it is cut, chopped, mixed, melted, cooked, cured, refined, canned, and otherwise prepared or handled in the same or in another establishment. This is termed product inspection. It begins with the carcass, viscera, fats, and other parts immediately they are passed by the veterinarians conducting the post-mortem examinations and continues until the fresh and prepared products are transported from the establishment.

In addition to the foregoing inspections of meat and meat food products, the inspectional and investigational work of seven fully equipped laboratories, advantageously located, form an essential part of the Bureau's meat inspection

service. The principal purpose of this inspection is to detect in samples collected at all establishments under inspection substances and ingredients not permitted by the regulations in meat or meat foods. In addition, water, ice, spices, and other substances used in the preparation of meat foods are examined for purity.

The destruction of condemned material is effected by reducing it to denatured grease and tankage, or, at establishments not having facilities for tanking, by effective treatment with crude carbolic acid or other approved denaturant. All condemned carcasses and other condemned material remain in the custody of the inspector until destroyed for food purposes at the same establishment where condemned.

The marks of inspection are placed on freshly dressed, passed carcasses by marking devices furnished by the Government. A purple, quick-drying, harmless fluid is used. Cans, jars, or other receptacles constituting, within the meaning of the regulations, immediate or true containers of passed product are marked by labels approved by the Bureau. The essential features required on a label are: The true name of the meat or product; a list of the ingredients, where two or more ingredients are used; the name and place of business of the manufacturer, packer, or distributor; an accurate statement of the quantity of contents; and an inspection legend and the number of the establishment at which the product was prepared.

In addition to the foregoing, other work of special economic value, aside from or in addition to its hygienic importance, is conducted. The following paragraphs are illustrative of such work.

In routine ante-mortem and post-mortem examinations of animals, many transmissible diseases are encountered and the origin of many such affected animals is traced, thereby enabling National, State, and local livestock sanitary officials to establish promptly appropriate control and eradication measures.

The widely distributed field forces of the Division render available to the Navy Department, Marine Corps, and a dozen other Governmental agencies expert professional and technical services on a cooperative basis in selecting meat and other foods purchased by such agencies under specifications.

The acceptance of American meat and meat products in foreign countries has depended largely upon the maintenance of an inspection in which the various countries had confidence, not only as respects meat hygiene, but also as respects requirements peculiar to individual countries. The meat inspection service has striven successfully to satisfy foreign countries and has thereby enhanced the economic interests of the livestock and meat industries.

Imports of meat and meat product are maintained on a common level, from a meat inspection standpoint, with our domestic output. In addition to the inspection of imported meat and product, animal casings from foreign countries are given special attention, and as an economic protection to the livestock industry in this country, casings from countries where certain diseases exist are required to be disinfected before being admitted.

The provisions of the meat inspection law requiring inspection specifically exempt farmers. However, they are required to identify their products properly while in interstate transportation and the shipper, who may or may not be the farmer who produced the meat or product, must certify to its eligibility for transportation in interstate or foreign trade. The law also authorizes the granting of a certificate of exemption to a retail butcher and a retail dealer supplying his customers. Certificate holders are held responsible for transporting or offering for transportation in interstate trade only wholesome meats and products.



## Pathological Division

The Pathological Division is engaged in routine examinations and research investigations on the diseases of domestic animals, including poultry, with the view of developing improved diagnostic methods and appropriate means of control. The more important diseases under investigation are anemia, infectious equine encephalomyelitis, periodic ophthalmia of horses, anaplasmosis, Johne's disease of cattle, hog cholera, erysipelas, influenza, and Salmonella infections of swine, hemorrhagic septicemia, rabies, and the various diseases of poultry.

Biochemical and other studies are made of the tubercle bacillus and its products, with the view of improving tuberculin. Practically all the tuberculin used in the campaign to eradicate tuberculosis in livestock in the United States is produced in this Division. Mallein for the diagnosis of glanders in horses and mules is also produced in the Division. Investigations are made of the germicidal efficiency of various products, and studies are made of the factors influencing the effectiveness of disinfectants. Outfits for determining the composition of baths used in official testing and for determining the phenol in biological products are prepared and distributed to field inspectors. Control is exercised over the stained antigens used under the provisions of the National Poultry Improvement Plan for the detection of pullorum disease in chickens.

Investigations of livestock poisoning by plants are also made. These studies include tests to determine the nature of toxic effects of plants in various stages of growth on both livestock and laboratory animals. Chemical studies are made to determine the nature and composition of poisonous constituents of plants, together with a search for appropriate means for the prevention and treatment of poisoning of stock by plants.

The Division cooperates with the regulatory divisions of the Bureau, in conducting laboratory investigations.

In cooperation with the Division of Virus-Serum Control, laboratory examinations are made of the various cultures, viruses, biological products, etc., produced under U. S. veterinary licenses.

In cooperation with the Field Inspection Division, diagnostic tests are made of blood sera of animals offered for import into the United States for the detection of such diseases as glanders and trypanosomiasis. Similar tests are made in connection with the control and eradication of these diseases as they might occur in the United States.

Laboratory examinations of specimen material from animals slaughtered under Federal meat inspection are made in cooperation with the Meat Inspection Division.

Laboratory service is also furnished the Tuberculosis Eradication Division and the Division of Tick Eradication and Special Diseases, as well as other divisions, from time to time.

### Division of Tick Eradication and Special Diseases

This Division directs the work of eradicating the cattle-fever tick (Boophilus annulatus) from the Southern States, Puerto Rico, and the Virgin Islands. It carries on the Bureau's field work in the control of hog cholera and related swine diseases. It also handles such special cases of livestock diseases as assigned by the Chief of Bureau.

The eradication of the cattle fever tick has been in progress since 1906, and this work which is done in close cooperation with State and county authorities and cattle owners is now nearing completion. When this campaign began the cattle disease then commonly known as Texas fever, transmitted through the bite of the tick, was one of the most serious diseases of livestock. For many years the cattle industry of the South was retarded and hampered by this parasite, the disease it transmits, and the resulting poor



condition and quality of the cattle raised in the tick-infested areas. The marketing of cattle from nearly one-quarter of the country was impeded owing to quarantine restrictions necessary in handling ticky cattle in separate portions of public stockyards, and the requirement that such cattle be sold for slaughter only. These embargoes were essential, as the infestation of northern cattle with the cattle-fever tick produced in them the fatal disease known as splenetic or tick fever.

No section of the United States has enjoyed greater benefits from a Bureau project than tick eradication has brought to the Southern States. The beneficial results of this work are felt throughout the South in the way of better herds of beef cattle and the fostering of a rapidly growing dairy industry.

In conducting the field work in the control of hog cholera this Division directs the field forces engaged in the investigation of outbreaks of hog cholera and allied ailments of swine and the suppression of such outbreaks.

Under the plan of work Bureau veterinarians are assigned to certain districts within a State. Their duties are to investigate outbreaks of swine diseases, hold autopsies, and make diagnoses. They give advice as to the proper method of treatment in case cholera is diagnosed. They assist farmers and practicing veterinarians in the handling of outbreaks and supervise the cleaning and disinfecting of premises. In sections, chiefly in the Southern States, where the services of veterinary practitioners are not available, Bureau inspectors occasionally perform the actual work of administering the serum preventive treatment. In localities where a practicing veterinarian is established Bureau inspectors do not render service of this nature.

Since the inauguration of hog-cholera control work immense savings have accrued to the swine industry and the losses from cholera have been materially reduced.

## Tuberculosis Eradication Division

The Tuberculosis Eradication Division was organized in the Bureau in May 1917. The work of the Division, as is the case of others, is conducted in close cooperation with the livestock sanitary authorities in each State. A primary object, has been to attain freedom from tuberculosis in the livestock of the country as well as in the poultry flocks, and, also, Johne's disease (paratuberculosis) in cattle. The testing of herds of cattle for tuberculosis and Johne's disease is done by Bureau, State, County, municipal, and accredited practicing veterinarians.

Cattle that react to the tuberculin test are appraised and condemned, and are slaughtered under Federal or State inspection. The payment of indemnity is assumed partly by the State and county and partly by the Bureau, except where no indemnity is paid from State or county funds, in which case no indemnity is paid by the Bureau for reacting cattle.

The close relationship of tuberculosis in animals and in human beings makes the eradication of the disease of great importance to the public, not only from an economic viewpoint but also from that of public health.

On November 1, 1940, every county in every State in the country, all of Puerto Rico, and the Virgin Islands, had been placed in the modified tuberculosis-free accredited area, signifying that tuberculosis among cattle in those areas had been reduced to less than one-half of 1 percent of the total cattle population. In order to safeguard against reinfection, however, it is necessary to conduct a considerable amount of retesting of cattle in all sections of the country. The total cost to the States, counties, and municipalities for operating expenses and indemnity since 1917 has been about \$183,580,000,, and the cost to the Federal Government for the same purposes since that time has been approximately \$89,516,000, or a total of \$273,096,000. Approximately 232,000,000 tuberculin tests have been applied to cattle since 1917 and about 3,800,000 reactors removed for slaughter.

In July 1934, the project for the control and eradication of Bang's disease in cattle was undertaken. This work is also conducted in cooperation with the livestock sanitary authorities in the various States under practically the same conditions as the eradication of tuberculosis. Bang's disease (contagious abortion) is found in cattle in practically all sections of the United States, and is the cause of serious loss to the cattle industry. It is much more prevalent in some localities than in others, a high degree of infection being found in the larger milk-shed areas. The majority of breeding troubles in cattle are caused by Bang's disease. Noticeable results of the infection are premature birth of calves and sterility. It has been shown that undulant fever in man is caused by the same organism that causes Bang's disease in cattle. Some cases have been reported which resulted from the ingestion of Bang's disease organisms in raw milk. Contact with animals infected with Bang's disease is also a means of transmitting undulant fever to man.

For a number of years the Bureau has been engaged in conducting various experiments to develop, if possible, a satisfactory means of artificially immunizing cattle against Bang's disease. During the course of these experiments a viable vaccine was developed from a low virulent culture of the Brucella organism which, when used on calves in station-controlled experiments, has given very encouraging results. The results attained were sufficiently encouraging to suggest a further trial of the vaccine under natural conditions. Consequently, a field project designed for this purpose was begun in January 1936, under a tentative plan which provided for continuing the study over a period of 5 years. As a result of the trial of this vaccine under field conditions by members of this Division, it was believed that its use under proper conditions would be helpful in the control and eradication of this disease. Calfhood vaccination was officially recognized by the Bureau on December 5, 1940, and it is anticipated that the vaccinal procedure will be cooperatively employed as an adjunct to the test-and-elimination method in a number of States where there is considerable infection of this disease.



## Virus-Serum Control Division

This Division is charged with the supervision of the preparation of biological products intended for the treatment of domestic animals in commercial establishments licensed by the Secretary of Agriculture. It receives and reviews applications for licenses which are accompanied by full descriptions of methods of production, testing, labeling, and the like, for these products. It recommends the issuance of licenses to applicants after determining within reasonable certainty that the products to be produced will not be worthless, contaminated, dangerous, or harmful within the meaning of the Virus-Serum-Toxin Act. After licenses have been issued the inspection consists of two types, depending upon the kind of products produced. In establishments producing anti-hog-cholera serum and hog-cholera virus inspectors are assigned to each and they supervise the preparation and testing of the products, and inspect all animals used in the process of manufacture. Licensed establishments producing such biologics as the various antitoxins, anti-serums, normal serums, aggressins, diagnostic agents, vaccines, viruses, toxoids, and bacterins, numbering over 90 different kinds, are given thorough inspection at irregular intervals for the purpose of determining that the methods of preparation, testing, and handling of the products, as well as the sanitary conditions of the laboratories, are satisfactory. On such occasions samples of products are taken whenever conditions justify such action. These samples frequently are examined in the Bureau's laboratories.

Labels, circulars, and the like, are examined in order to insure that the products are not labeled and thus advertised in a false or misleading manner. There are at present 75 licensees producing biological products for the treatment of domestic animals under the supervision of this Division.

Applications for permits are considered and the permits are issued for the importation of such biological products, organisms, and vectors as may not introduce from foreign countries, animal diseases that are not prevalent in the United States.

This Division administers the marketing agreement for handlers of anti-hog-cholera serum and hog-cholera virus, which became effective December 7, 1936, by an order of the Secretary of Agriculture. The object of the marketing agreement and order is to stabilize the serum-virus industry for the purpose of insuring an adequate supply of these products to the hog producer under all circumstances.

### Zoological Division

The Zoological Division conducts investigations of parasites and parasitic diseases of domestic animals, including poultry. The parasites are studied from the standpoint of classification, morphology, life history, immunology, ecology, distribution, and injury to their hosts. The information thus accumulated serves as a basis for formulating control measures. Investigations are conducted on the therapeutic effects of drugs with reference to their use for the destruction of external and internal parasites. Many important treatments for the control of parasites have been discovered in the course of these investigations.

Many useful discoveries have been made and recorded regarding the parasites of cattle, swine, sheep, horses, dogs, and poultry. Among the more important achievements



are the swine-sanitation system to control roundworms and kidney worms; the discovery of carbon tetrachloride and tetrachlorethylene as effective remedies for hookworm disease, of phenothiazine for the removal of important worm parasites of equines and ruminants, of barium antimonyl tartrate for the removal of gapeworms from poultry, and the standardization of most anthelmintic treatments in use the world over; the formulation of satisfactory meat inspection procedures for controlling trichinosis and tapeworm infections of man; and the discovery of the common human hookworm in the United States.

The Division maintains an index-catalogue of all parasites reported from all parts of the world. This catalogue contains the most complete index to the literature of parasitology to be found anywhere. One of the largest and most valuable parasite collections is maintained in the Division for comparative study; this collection is a part of the collections of the United States National Museum.

### P e r s o n n e l

Since most of the work of the Bureau pertains to veterinary problems, it follows that a large number of its employees are veterinarians. Except in the Animal Husbandry Division, the professional personnel consists largely of graduate veterinarians skilled in the diagnosis of animal diseases, in the application of preventive measures in the field, in work involving laboratory investigations, and in the detection of abnormal conditions in meat-producing animals at time of slaughter.

The requirements for appointment to veterinary positions in the Bureau are four years of study in, and graduation from, recognized veterinary colleges. In turn, graduation from a standard four-year high school course and one year of pre-veterinary college work are prerequisites for matriculation at a recognized veterinary college.

In addition to its trained veterinarians, the Bureau's personnel includes experienced research workers and specialists qualified to perform the work outlined in the preceding discussions of the various divisions of the Bureau. Not only must these scientists have a thorough knowledge of their professions, but they must, in certain assignments, be qualified to meet and cooperate with State and city officials, college professors, the medical profession, commercial organizations, and the general public.





